

## THAT WHICH IS CLAIMED IS:

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1. A catalyst system comprising the product resulting from the combination of a metallocene having a monoorganoamide bonded to the metal of the metallocene and a cocatalyst having alkylaluminum functionality.
  2. A catalyst system according to claim 1 wherein the cocatalyst comprises an organoaluminosiloxane.
  3. A catalyst system according to claim 2 wherein the cocatalyst comprises a trialkylaluminum.
  4. A catalyst system according to claim 3 wherein the cocatalyst comprises trimethylaluminum.
  5. A catalyst system according to claim 4 wherein the cocatalyst comprises methylaluminosiloxane and the monoorganoamide is a monoarylamide.
  6. A catalyst system according to claim 5 wherein the aryl group of the monoarylamide radical is selected from the group consisting of phenyl, 2,6-diisopropylphenyl, 2,4-difluorophenyl, 2,6-dimethylphenyl, 2,3,4,5,6-pentafluorophenyl, 4-<sup>tert-butyl</sup>phenyl, and 2-methylphenyl.
  7. A catalyst system according to claim 6 wherein the metal of the metallocene is zirconium.
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8. A catalyst system according to claim 7 wherein the aryl group of the monoarylamide radical is phenyl.

9. A catalyst system according to claim 7 wherein the aryl radical of the monoarylamide radical is 2,6-dimethylphenyl.

10. A catalyst system according to claim 7 wherein the aryl radical of the monoarylamide radical is 2,4-difluorophenyl.

11. A process for polymerizing an olefin comprising combining at least one olefin with a catalyst system as set forth in claim 1 under suitable polymerization conditions.

12. A process according to claim 11 wherein ethylene is polymerized and the cocatalyst comprises methylaluminoxane.

13. A process according to claim 12 wherein the catalyst system is produced by combining the cocatalyst with bis(cyclopentadienyl) zirconium bis(monophenyl amide).

14. A process according to claim 12 wherein the catalyst system is produced by combining the cocatalyst with bis(cyclopentadienyl) zirconium bis(2,6-diisopropylphenyl amide).

15. A process according to claim 12 wherein the catalyst system is produced by combining the cocatalyst with bis(cyclopentadienyl) zirconium bis(2,4-difluorophenyl amide).

16. A process according to claim 12 wherein the catalyst system is formed using a bridged metallocene having polymerizable unsaturation attached to at least one cyclodienyl group.

17. A process according to claim 16 wherein the catalyst system is formed using a metallocene selected from <sup>the group consisting of</sup>  $\Lambda$ 1-(9-fluorenyl)-1-(cyclopentadienyl)-1-(methyl)-1-(but-3-enyl) methane zirconium bis (monoaryl amide)s.

18. A process according to claim 12 wherein the catalyst system is formed using a metallocene having an indenyl group and a fluorenyl group connected by a bridging structure wherein both the indenyl group and the fluorenyl group are pi bonded to the metal of the metallocene.

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